The Brattle Group

Reverse Auction Issues

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February 26, 2013

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Agenda

First, some optimism

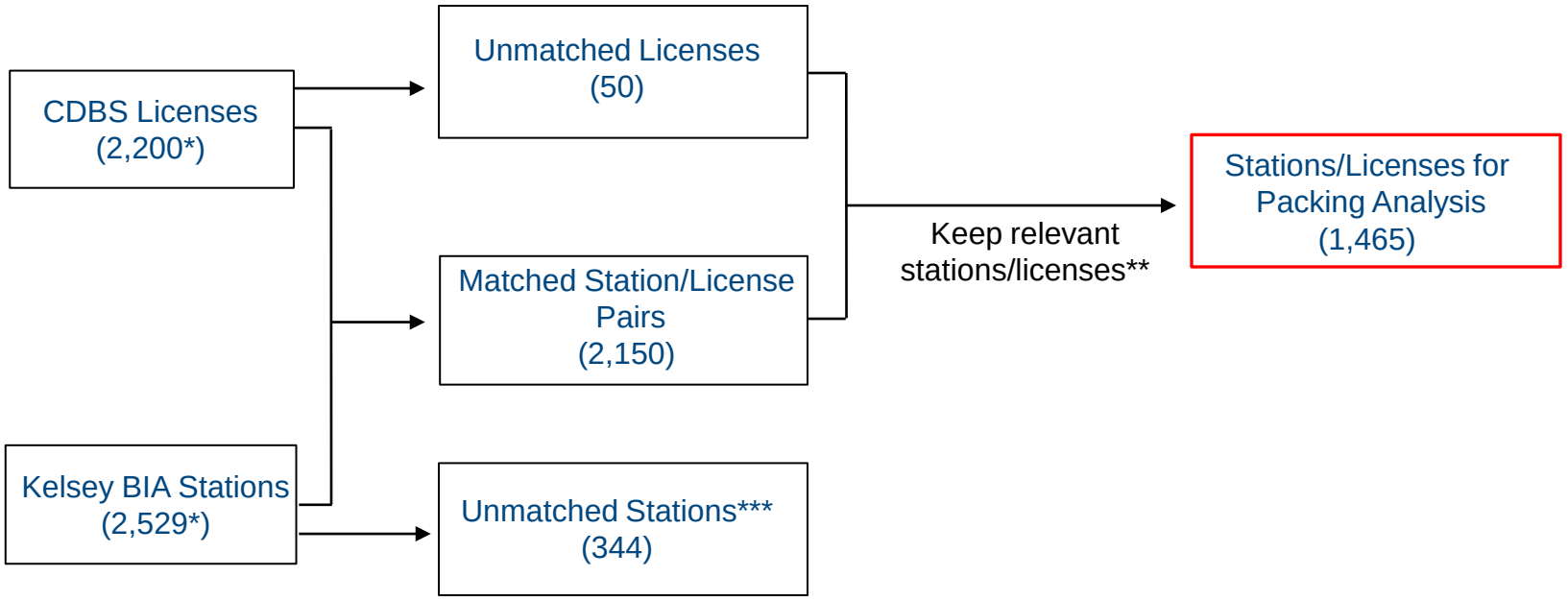
Then, some pessimism

We Can Do This!

For all of the scenarios, we:

- Developed a database of the location of all digital high powered, Class A low powered, digital and analog Mexican, and digital Canadian TV broadcast stations and Land Mobile authorizations in the TV band;
- Collected 2011 revenue data for the U.S. stations and developed bids proportional to revenues;
- Repacked all U.S. stations, generally ordering by educational first then decreasing by the station's preliminary estimate of cost to clear in auction;
- Cleared stations starting on the repacked channel 51, moving downward in the channel order until a target amount of spectrum was cleared; and
- Determined by market which stations would be bought out and an estimate of the market clearing price.

Data Setup



*Puerto Rico stations/licenses removed

**Remove VHF, translators, non-class A or non-digital high-power stations/licenses

***License not likely eligible to bid and other technicalities

Separation requirements – US Stations

U.S. Separation Requirements Separation Distance (km)				
	Co-Channel Zone		Adjacent Channel Zone	
	1	2, 3	1	2, 3
US-UHF - Full Power	196	224	24-110	24-110
US-UHF - Low Power Digital	104	104	20-58	20-51
US-UHF - Low Power Analog	104	104	20-58	20-51

Source: Electronic Code of Federal Regulations

Actual Distances Used Separation Distance (km)		
	Co-channel	Adjacent Channel
Full Power - Full Power	224	24-110
Low Power - Low Power	104	20-58
Low Power - Full Power	164	22-84
Full Power - Low Power	164	22-84

Separation requirements – Fixed

Canadian Separation Distance by Station Type Separation Distance (km)		
Class	**Co-channel**	**Adjacent Channel**
A	386	94
B	367	105
C	359	130
VU	371	142
VL	386	149

Source: FCC Letters of Understanding

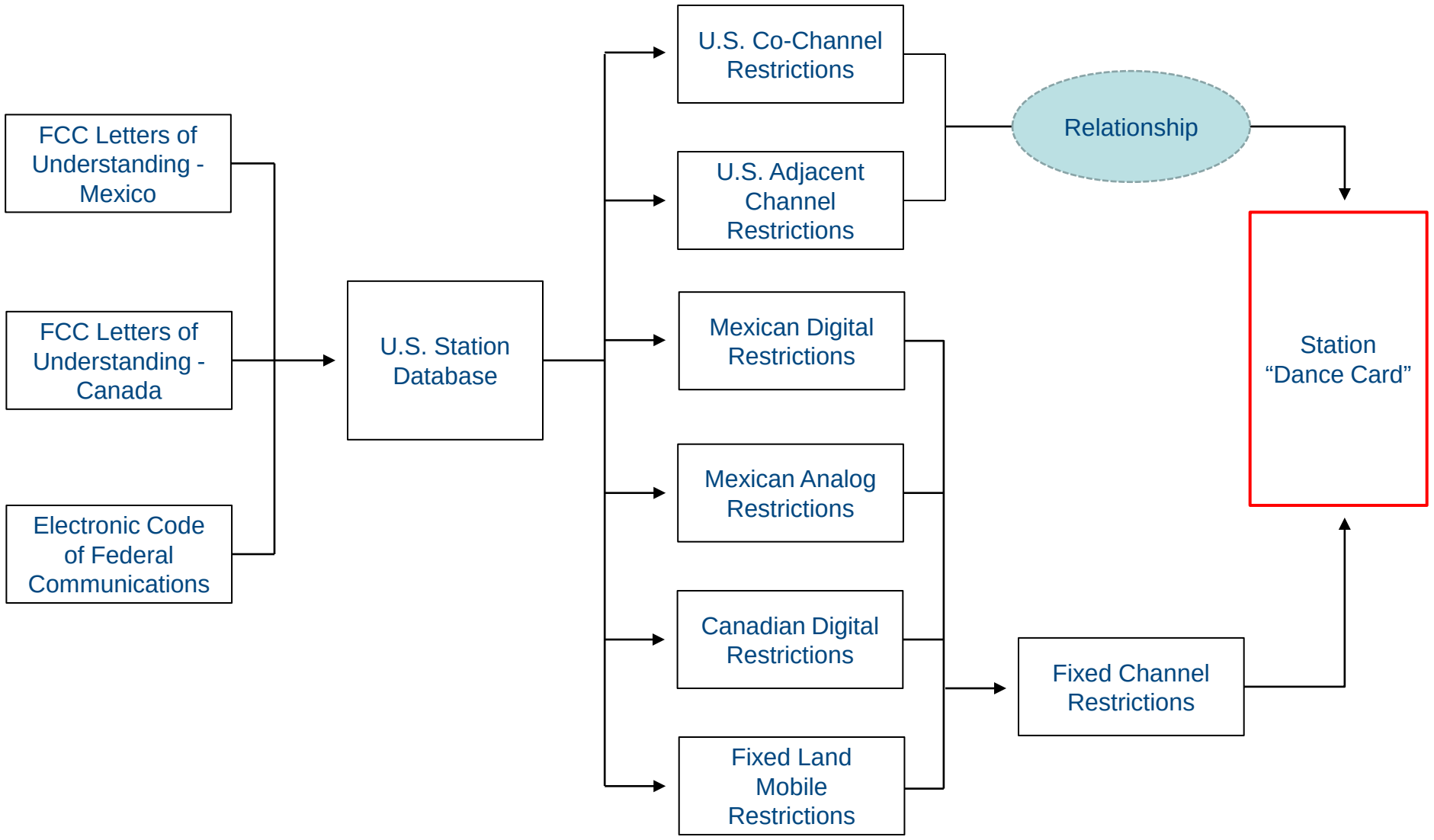
Fixed Land Mobile Separation Distance (km)		
	Co-channel	**Adjacent Channel**
Land Mobile	249	145

Source: Electronic Code of Federal Regulations

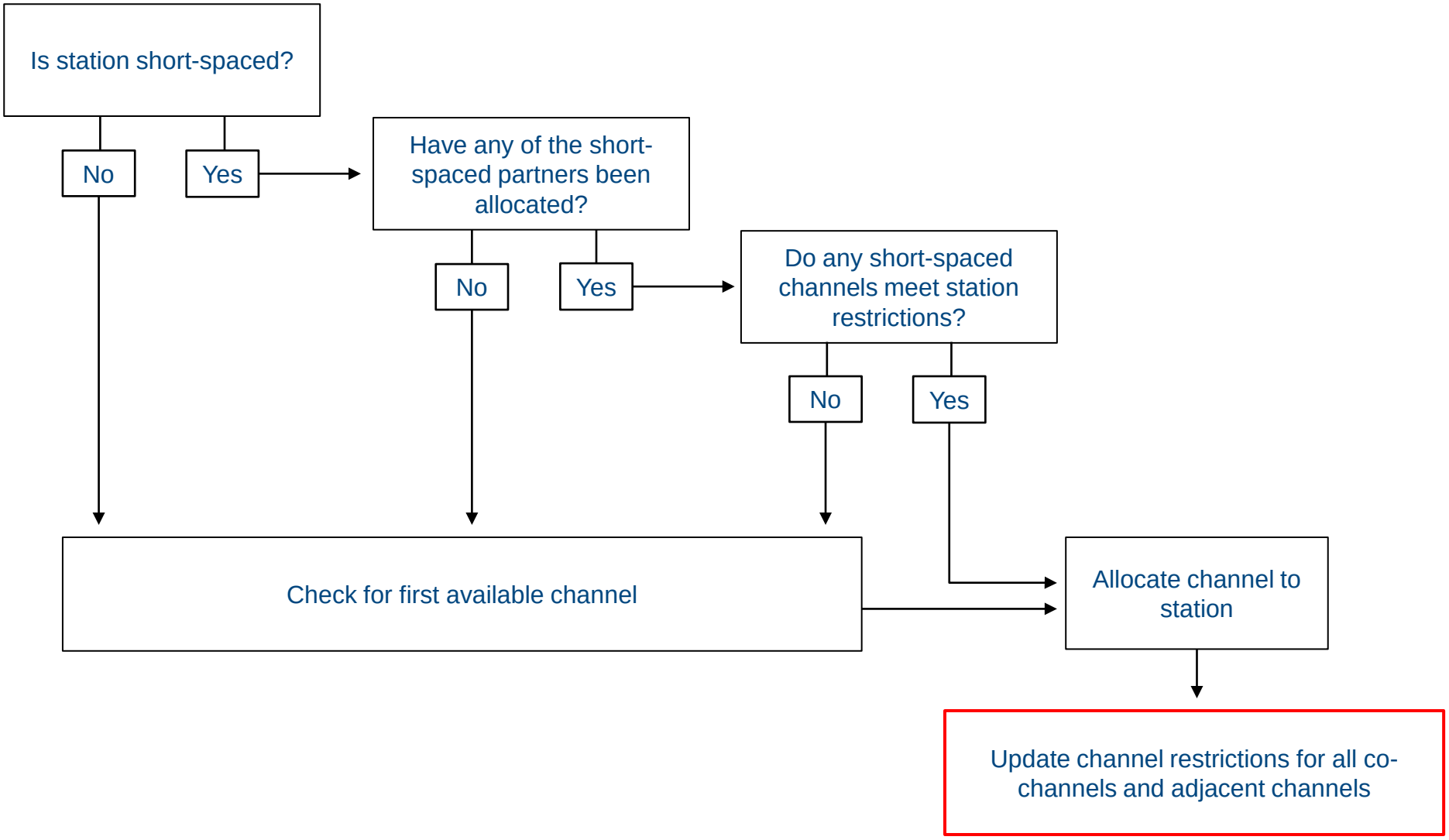
Mexican Separation Distance by Channel Type Separation Distance (km)		
Station Types	**Channel Separation**	**Requirement**
DTV-DTV	Co-channel	0 - 223
DTV-DTV	+/-1	32 - 88
DTV-NTSC	Co-channel	0 - 244
DTV-NTSC	+/-1	10 -88
DTV-NTSC*	+/-2	24 - 32
DTV-NTSC*	+/-3	24 - 32
DTV-NTSC*	+/-4	24 - 32
DTV-NTSC*	+/-7	24 - 95
DTV-NTSC*	+/-8	24 - 32
DTV-NTSC*	+/-14	24 - 95
DTV-NTSC*	+/-15	24 - 96
*Taboo Channels		

Source: FCC Letters of Understanding

Channel Restrictions



Allocation Algorithm



We Can Do This!

1. **Full power station minimum:**
   - Allocated market by market according to market rank.
   - Within each market, the stations with highest marginal cost are allocated first.

2. **Educational stations:**
   - Allocated market by market according to market rank.

3. **Full power:**
   - Allocated by marginal costs.
   - Ordering does not depend on market, purely on the cost of removal.

4. **Low power:**
   - Allocated market by market according to market rank.

5. **Educational stations for sale:**
   - Allocated market by market according to market rank.
   - Not always met due to either channel restrictions or more commonly a shortage of full power stations in the market.

2nd price rule: pay marginal bid not taken in DMA

Caveats: bid estimates from tail of recession

<u>Clearing 120 MHz</u>

NAB 391 stations, we got 385 stations.

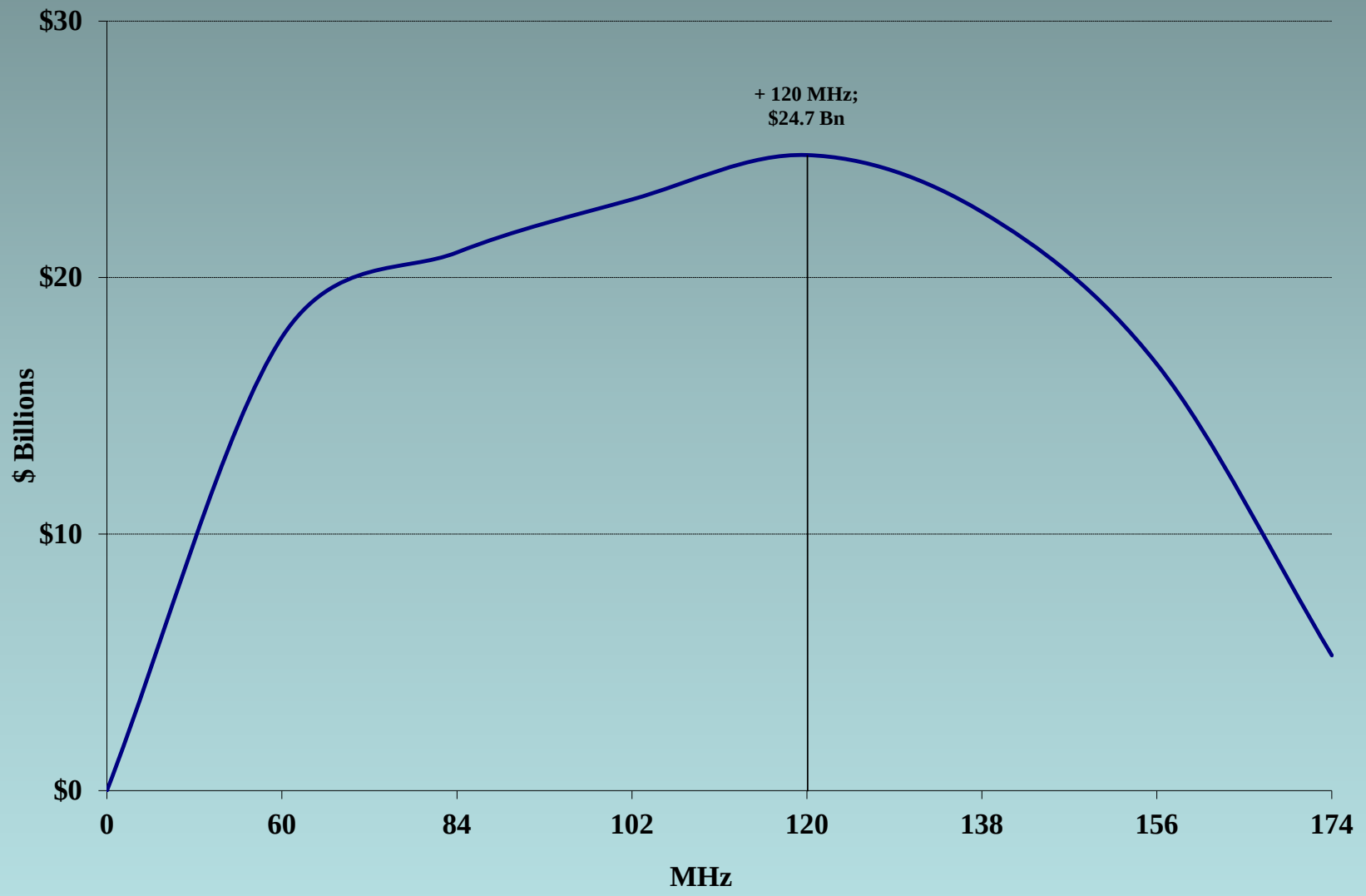
$14.4 billion in bid payments to broadcasters

<u>Clearing 60 MHz</u>

NAB 151 stations, we got 163 stations.

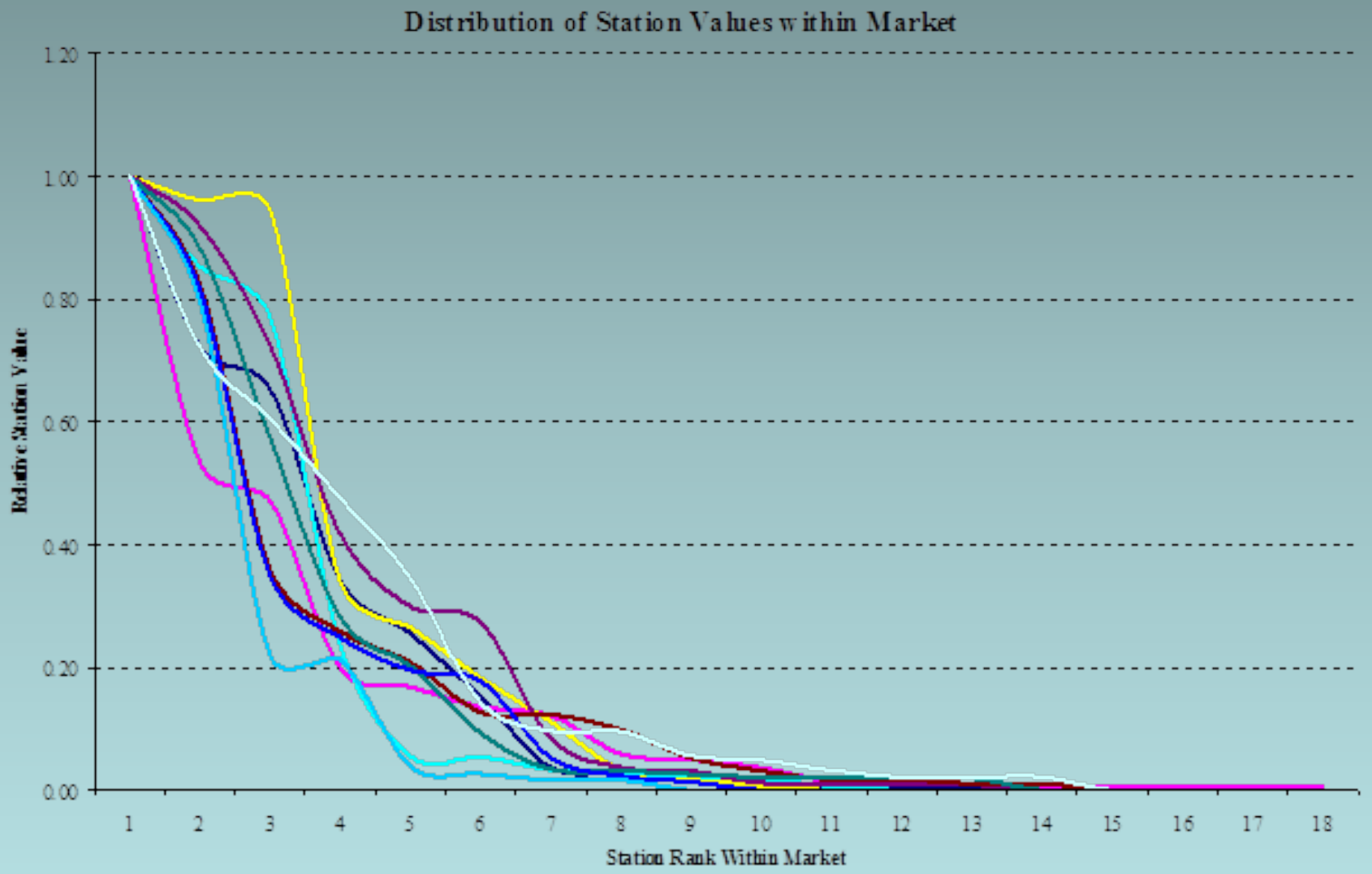
$2.7 billion in bid payments to broadcasters

We Can Do This!



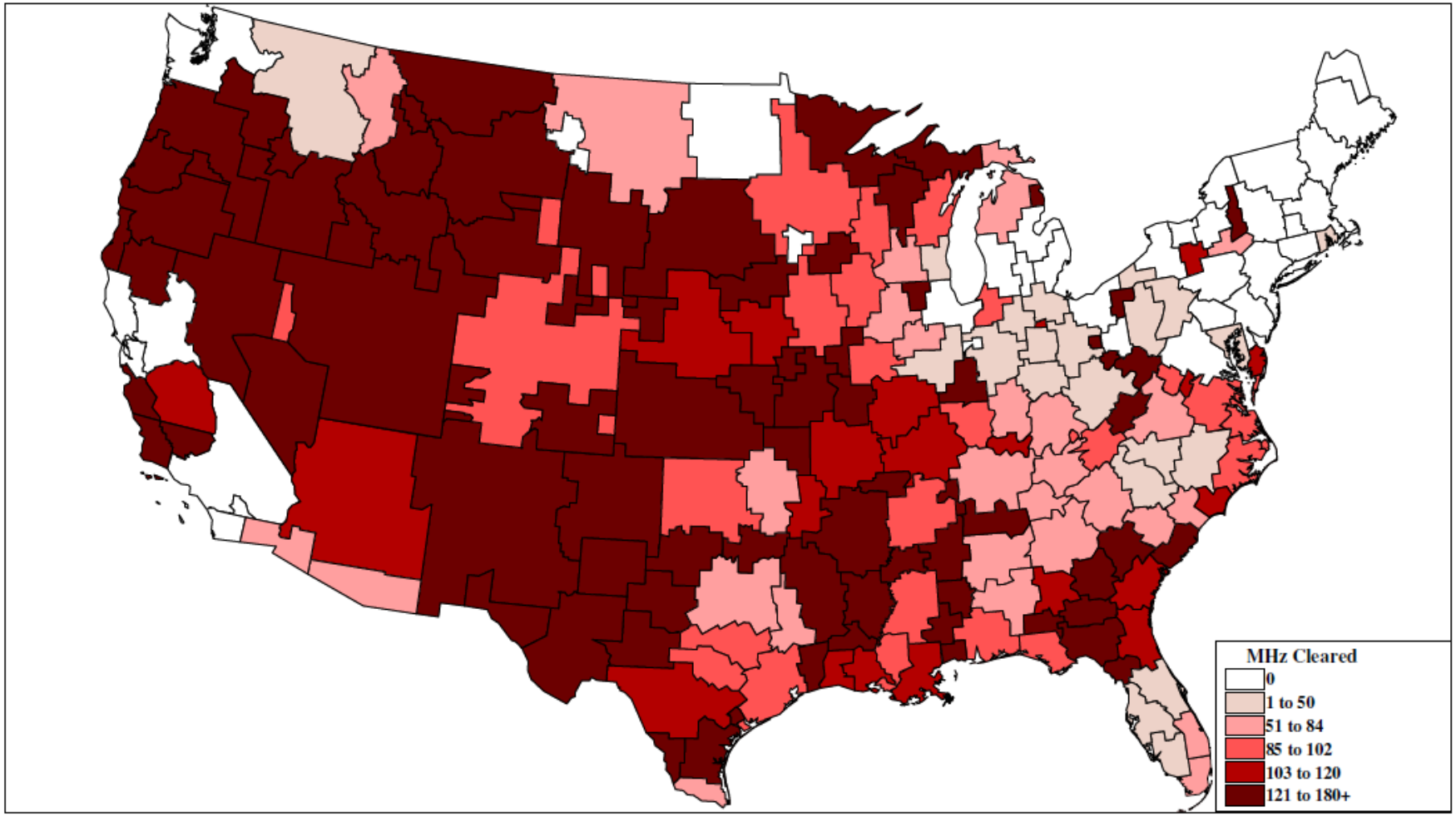
So, what could go wrong?

1. Number of Educational Stations Participating
2. Number of Broadcasters Sharing Channels
3. Number of Broadcasters Refusing to Sell
   - Individual bidders have limited holdup power, but unless low and mid value broadcasters are willing to participate and formulate reasonable bids, prices will be higher, up to the point of a reduction in the amount of spectrum cleared.

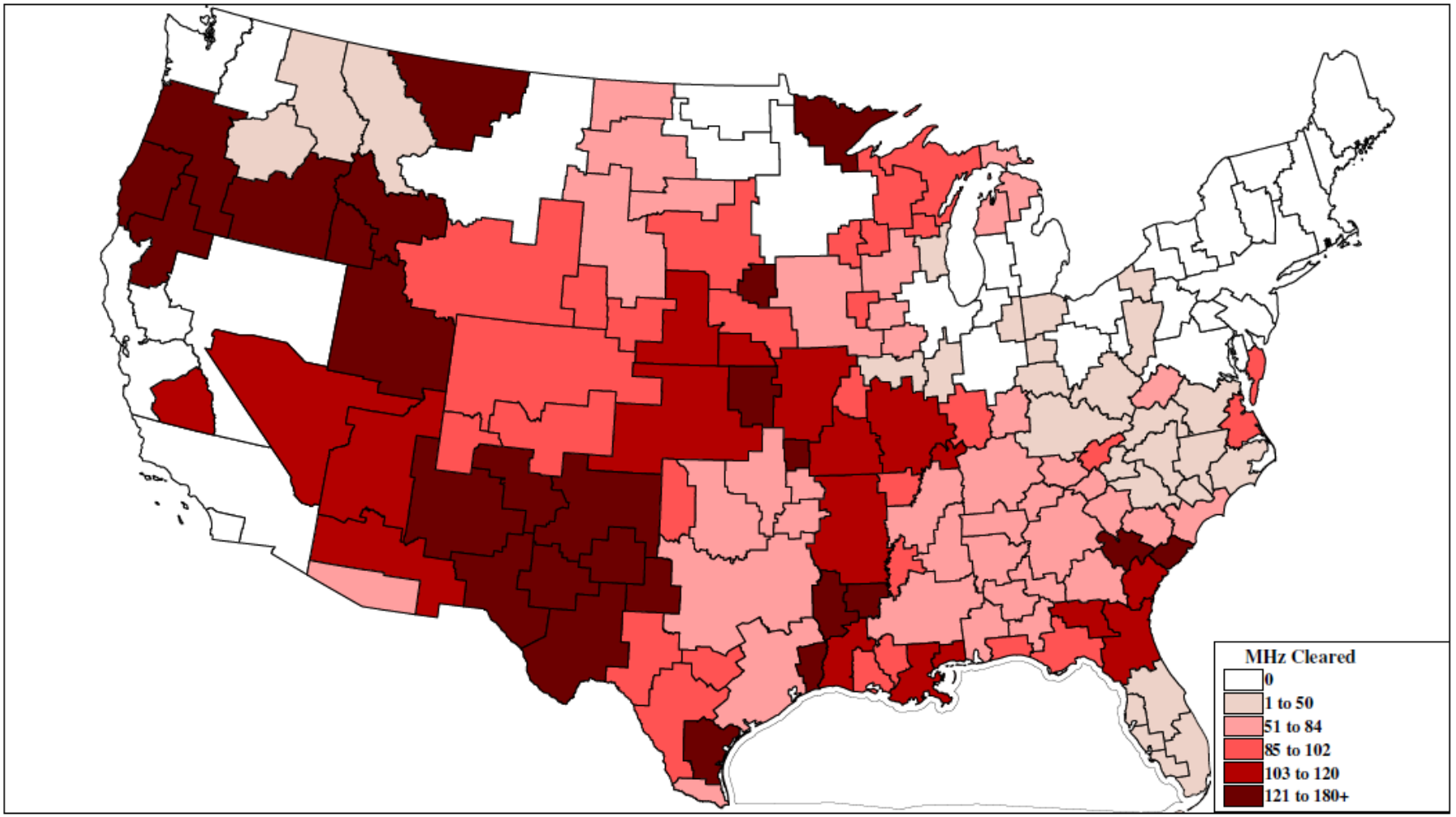


Source: http://www.fcc.gov/fp/Bureaus/MB/Databases/cdbs/. Also, BIA/Kelsey. Investing in Television Market Report 2010.

Estimated MHz Cleared by Repacking Alone by Designated Market Area (DMA)



Estimated MHz Cleared by Repacking Alone by Economic Area (EA)



Conclusion: Ingredients of a Successful Auction

A successful auction is one that transfers the maximum amount of spectrum from broadcasting to mobile broadband uses.

The key **to a successful auction (both Forward and Reverse) is participation.**

Proposition: Participation dominates *all* other concerns about efficiency of various rules.

Discuss among yourselves!

Speaker Bio and Contact Information

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Dr. Coleman Bazelon is a principal in the Washington, DC office of The Brattle Group. He is an expert in regulation and strategy in the wireless, wireline, and video sectors. He has consulted and testified on behalf of clients in numerous telecommunications matters, ranging from wireless license auctions, spectrum management, and competition policy, to patent infringement, wireless reselling, and broadband deployment.

Dr. Bazelon received his Ph.D. and M.S. in Agricultural and Resource Economics from the University of California at Berkeley. He also holds a Diploma in Economics from the London School of Economics and Political Science and a B.A. from Wesleyan University.

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